Remarks

The Final Action of December 14, 2007 has been received and carefully reviewed. As of the Office Action, claims 1-18 and 21-22 are pending and claims 2 and 11 are withdrawn from consideration. Claims 1, 3-10, and 12-18, and 21-22 stand rejected. Claims 1 and 10 are independent.

I. Amendments to the claims.

Claims 1 and 10 are amended to more specifically recite the workpiece is an alpha-beta titanium alloy, support for which is found at paragraph [0002] of the Application as originally filed. Claims 1 and 10 are also amended to more specifically recite that the forged gas turbine engine component is machined as part of the post-forging processing prior to post-forge heat treating, support for which is found at paragraph [0021] of the Application as originally filed. Finally claims 1 and 10 are amended to more particularly recite that no additional heat treatment steps other than those specified are present or required to provide the improved results, support for which is found at [0028] and throughout the Application as originally filed. No new matter is presented.

II. Rejection under 35 U.S.C. §103(a).

Claims 1, 3-5, 10, 12-14, and 21-22 are rejected under 35 U.S.C. §103 as unpatentable over U.S. 4,898,624 to Chakrabarti (Chakrabarti) in view of the archived website www.timet.com/timetal6-4frame.html (Ti-Met) and U.S. 4,563,239 to Adinolfi (Adinolfi). Claims 6, 7, 15 and 16 are rejected under 35 U.S.C. §103 as unpatentable over Chakrabarti in view of Ti-Met and Adinolfi, and further in view of ASM Handbook Volume 4 pages 913-923 (ASM Handbook). Claims 8-9 and 17-18 are rejected under 35 U.S.C. §103 as unpatentable over Chakrabarti in view Ti-Met and Adinolfi and further in view of U.S. 6,370,956 in view of Bewlay (Bewlay). The rejections are respectfully traversed.

As stated by the Federal Circuit, "a proper analysis under 35 U.S.C. § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or

carrying out, those of ordinary skill would have a reasonable expectation of success." *In re Vaeck*, 947, F.2d 488, 493 (Fed. Cir. 1991). In addition, the prior art reference(s) must teach or suggest all of the claim limitations. The teaching or suggestion to combine and the reasonable expectation of success must both be found in the prior art, and not in Applicant's disclosure. *Id.* at 493. *See also* MPEP §2142.

Applicants incorporate the prior arguments as set forth in the previous response filed October 12, 2007, in addition to presenting the following remarks.

As understood by Applicants, Chakrabarti teaches starting with a beta alloy workpiece (col. 2, lines 30-38). The billet is processed 40F to 70F above the beta transus temperature and is comprised of a beta processed structure containing only beta grains containing a beta microstructure, i.e. no spheroidized primary alpha islands in a matrix of transformed beta. See, e.g., col. 2, lines 38-47.

As a result of this and the various heat treating steps, the entire part formed by the method in Chakrabarti has a high strength, as illustrated by the experimental results presented and the figures, which were stated to have been taken at a mid-height, mid-radius location (i.e., in the middle) of the pancake forgings.

As amended, each of independent claims 1 and 10 require that the workpiece be an alpha-beta titanium alloy and that the forged engine component be rough machined prior to heat treating. Applicants' invention starts with a workpiece that is alpha-beta alloy. As a result it does not require the additional pre-processing of Chakrabarti to form a beta alloy workpiece or the post forging increased number of heat treatments. The use in Chakrabarti of a beta alloy workpiece subjected to extra heat treatments also contributes to the enhanced strength throughout the part formed by the process disclosed in that reference. However, because high strength is not ordinarily needed throughout the part, only at the surface and near surface of the final machined parts (see, e.g., Application at [0028]). Thus, the additional expense in starting with the beta alloy workpiece of Chakrabarti is generally wasted because it results in high strength even where it isn't needed.

In contrast, according to Applicants' claimed invention, the combination of using the alpha-beta processed alloy and rough machining prior to heat treating, along with a reduced number of heat treatments, results in producing high strength where it is needed most: at the

surface and near surface regions of the finished part which are the locations that experience the highest stress conditions during service, none of which is taught or suggested by Chakrabarti. Furthermore, there would be no reason to rough machine the forged workpiece of Chakrabarti, because the entire part is high strength. Thus, the there would be no danger that the high strength region would be removed by machining after heat treatment, as could occur in a situation in which all machining took place after a heat treatment that only resulted in strengthening at a surface or near surface region of the pre-machined component.

None of the other cited references fail to overcome the deficiencies of Chakrabarti, which is directed to a fundamentally different process to achieve a fundamentally different result. Ti-Met merely relates to certain processing conditions for Ti64 and states the strength is affected by section size and cooling rates are critical to strength. Adinolfi is directed to tumbling titanium parts in a barrel or container that is filled with a mixture of a paste /soft filler soaked in an acid that attacks the titanium. This process is intended to remove the thin oxygen rich surfaces generated during heat treatment without damaging the part, but has no relevance to Applicants' claimed invention which relates to heat treating a specific shape to obtain specific properties.

Thus, a prima facie case of obviousness has not been presented and the rejection should be withdrawn and claims 1 and 10 allowed, along with all claims depending therefrom.

CONCLUSION

For at least the reasons set forth above, Applicants respectfully request reconsideration of the Application and withdrawal of all outstanding rejections. Applicants request allowance of all pending claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicants' undersigned representative.

This Response has been filed within two (2) months of the mailing date of the Final Action and it is believed that no fees are due with the filing of this paper. In the event that Applicants are mistaken in these calculations, the Commissioner is hereby authorized to deduct any fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Respectfully submitted,

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